

**CORNER
OFFICE**

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Can you tell us how Sigma Design Company came about and your role in it?

Sigma Design Company was started as a machine design firm in 1962 by two brothers Murph and John Abraham. With the steady decline in New Jersey manufacturing, machine design was becoming a tough way to make a living. In 1998 they were seriously thinking about closing the doors. I had known John and Murph for 10+ years. One day we were at lunch and John said if the right person came along they would probably sell. Up to that point I had spent the previous 12 years as the chief engineer at Hayward Industrial Products in Elizabeth NJ.

The idea of being an entrepreneur was a lifelong dream and I felt this was my chance. Long story short,... I acquired Sigma Design on Feb 15th 1999. Since then we have transformed the business to provide complete new product and manufacturing services. I guess you could say that we have developed into a unique single source engineering and manufacturing solution provider.

It's always been about innovation. Can you tell me about your innovation process? How do you keep your team innovating?

Well the most challenging aspect in innovation is not to think of it as some magical strike of lightning event. Innovation in a manufacturing oriented environment requires a consistent approach and process. You allow experienced smart people to dig deep into a project challenge and then after some initial ideas and thoughts have been developed let them share and discuss their project challenges and goals with others on the same team. Good things can happen when we foster this type of positive and creative environment.

What has been the biggest game-changing factor in industrial design and manufacturing processes over the last 25 years? How have you dealt with it?

I have to say from a design engineering and manufacturing perspective, new engineering analysis and product simulation tools provide a most useful tool for us. We are able to develop full product visualization. Looking deeply into the actual deflections, stress levels, heat transfer and fluid flow profiles in parts and assemblies that may have been ignored in the past. Advanced engineering simulation allows us to uncover non-obvious, and sometimes counterintuitive, design flaws early and fix them. I fully understand the importance of 3D printing—we've been doing this in house for 8 years now—but first we must be able to see how a product component behaves so that we can quickly make improvements and changes prior to ever making a part.

Then of course 3D printing and rapid prototypes allow the user to physically see and feel the component being designed. For instance, we are working on a new skateboard-training device. We can simulate the loads and forces and produce live online simulations. This has enabled us (and the client) to understand the product's internal behavior and in most cases allows us to design better and less expensive product. After all, what good is a beautiful product if it cannot be manufactured smartly and efficiently?

How has Sigma Design Company evolved over the years? Has your approach to manufacturing design changed?

We have been pulled by our customers to become more engaged in the manufacturing process: In fact that is why we purchased our new 20,000 sq-ft. facility in 2011. Customers today want more than a set of design drawings. They need products and systems piloted, tested, debugged and then refined. Often they simply do not have the internal resources to dedicate to refining and perfecting engineered systems.

What was one of your most-challenging projects your team faced, and how did you find a solution?

That's a tough one. Since 1999, Sigma Design has delivered over 1000 successful design and engineering projects. Most of these have

been in the electronics, life science or clean tech industries. That said, we were once approached by a Boston venture group that needed to develop a pilot renewable energy hydrokinetic generator system. It was a pivotal milestone for the venture's funding and they needed this fully submerged run-of-river device in the water and producing electrical energy in 6 months from our first meeting.

In addition to the accelerated timeline, the project provided us with several other challenges. Most notably in power generating electronics, hydrodynamic balancing/loading and marine submersion fouling. In the end we were successful in that the system was designed, manufactured and installed. In fact I believe it is still running deep in the Mississippi River north of New Orleans.

After 25 years, I assume there have been some pretty fun projects. What was one of your favorites?

Right now we are helping a small family business develop an artisan's butter churn. This will be a new kitchen and housewares industry product. What is making it such a fun project is the personal involvement with the client. The communal aspects, the feel, the look, butter tastes and consistency, etc. We have gotten deep into each salient design feature; user preferences, the feel, smoothness, style issues and the overall vision of the product. A butter churn is not necessarily a novel device but we believe this one will be the best on the market and will serve the artisan food movement well.

How does your company vision and culture fit into your hiring process?

We are proud to be involved in the recent local-manufacturing renaissance and every Sigma team member feels a strong commitment toward designing innovative designs that are manufacturable. Our team provides experience in design and commercialization, we stay current in advanced engineering techniques and provide accelerated development at a fair price.

So to achieve this we look for intelligence and values first. We need to find people who we believe will fit our team approach and have the ability to adapt to new challenges. They need to be looking to grow personally and professionally by getting involved with difficult and sometimes uncomfortable projects that are somewhat under defined. In many cases we are being asked to do things that have not been done before. So candidates must be confident, self-starters with a curious nature. Someone who wants to know not only how things work, but who can offer alternatives to why it must work this way. And of course since we work in small development teams, people must be friendly and able to work under pressure in a time-constrained environment. It is rare that any of our customers tell us "take your time".

What's next for Sigma Design Company?

Well we hope to fill our new facility with custom low volume highly technical design and manufacturing projects. These can be one of a kind design/build engineered systems or low volume analytical appliances. We are currently in negotiations with several new ventures that need our skills and believe, as we also believe, that there is a future for Made in the USA, Made in New Jersey Manufacturing.

If you could work on any project in the world, what would you want to work on?

We have had the opportunity to collaborate with several universities and are really excited about working with them as they try to push forward the many inventions and ideas that never make it to commercialization.

And since many of us love the marine environment I think it would be safe to say we would be very interested in anything involving marine systems such as shellfish farming improvement projects and equipment. Maybe I will retire in 10 years and become a mollusk farmer. ■